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CHAPTER 14

EYEWITNESS TESTIMONY

Michael W. Eysenck

You are a juror in a case involving serious assault. You are finding it very difficult to decide whether the defendant is indeed the person who carried out the assault. This is because nearly all the evidence that has been presented is indirect or circumstantial, and so not really very convincing. However, there *is* one piece of evidence that appears to be very direct and revealing. The person who was assaulted identified the defendant as her assailant in a lineup. When you observe this eyewitness being questioned in court, you are impressed by the fact that she seems very confident that she has correctly identified the person who attacked her so viciously. As a consequence, you and your fellow jurors all decide that the defendant is guilty of serious assault, and he is sentenced to several years in prison.

It is not all that unusual for a guilty verdict to depend heavily on eyewitness testimony. For example, thorough analysis of trials in England and Wales many years ago revealed that over 200 lineups were held in a single year. Of these, 45% led to a suspect being picked out, with 82% subsequently being convicted. Of most relevance here, there were nearly 350 cases in which eyewitness identification was the only real evidence of guilt. Even here, 74% of defendants were convicted, indicating the substantial weight given to eyewitness testimony.

Consider the following case discussed by Elizabeth Loftus (1979). On 15 May 1975, the assistant manager of a department store in Monroe, North Carolina, was forced into a car by two men, one of whom pointed a gun at him and told him to lie down in the back of the car. He got only a glimpse of the men before they pulled stocking masks over their faces. They then drove to the store and demanded that he open the safe. He convinced them he did not know the combination, so they took 35 dollars from his wallet and let him go.

The victim, Robert Hinson, could say very little about his kidnappers other than that one of them looked Hispanic and that their car was an off-white 1965 Dodge Dart. However, he also said that one of them resembled a man who had recently applied for a job in the store. On the basis of this fragmentary evidence, a composite sketch was created of one of the suspects.

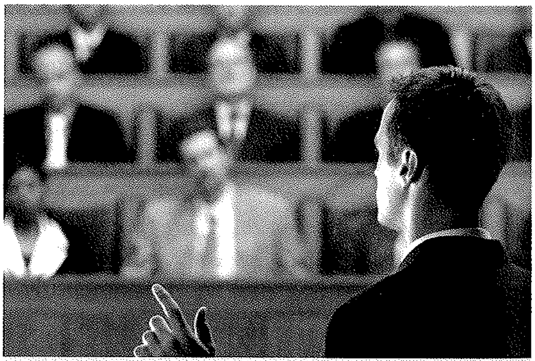
Three days later the police stopped a 1965 white Plymouth Valiant and arrested the driver and passenger, Sandy and Lonnie Sawyer. Neither of them looked like the composite sketch, neither had applied for a job at the store, and both denied knowing anything about the kidnapping. At the trial, Robert Hinson positively identified the Sawyers as the men who had kidnapped him. Despite four witnesses testifying that Sandy was at home at the time of the kidnapping, and four others vouching that Lonnie was at a printing plant visiting his girlfriend, the jury found the Sawyers guilty. As they were led from the court, Lonnie cried out, "Momma, Daddy, appeal this. We didn't do it!"

The Sawyers were lucky to have the support of a determined and persevering family, a tenacious private detective, and a television producer who had become interested in the case. Their first real break came in 1976 when Robert Thomas, a prisoner at a youth center, admitted to being one of Hinson's kidnappers. Encouraged by this, the detective re-checked some of the earlier leads and discovered that Thomas had indeed applied for a job at the store shortly before the kidnapping. Furthermore, he had a friend whose mother owned a 1965 Dodge Dart. The detective went on to interview some of the jurors. Some of them admitted that the evidence had not seemed very strong, but they eventually became tired and simply went along with the majority.

The justification for a retrial seemed very strong. However, the judge decided that, despite the new evidence, too much time had elapsed. The Governor of North Carolina was petitioned for a pardon. Before the outcome was known, Thomas confessed in writing and then on camera. He subsequently recanted, but then finally withdrew his recantation. On that day, the Governor pardoned the Sawyers. They had spent 2 years in jail, had narrowly escaped sentences of 28 and 32 years, and the process of freeing them had cost their impoverished family thousands of dollars. All this misery was endured because of jurors' willingness to accept the word of the victim, who admitted that he saw his assailants only briefly. Interestingly, the jurors were much more impressed by the eyewitness testimony of the victim than that of *eight* witnesses who testified that the accused could not have been present at the crime. Clearly, there were powerful forces at work here—sympathy for the victim, outrage at the attackers, and a feeling that someone should be brought to justice. Given a plausible candidate, it is all too easy to persuade oneself that the crime is solved, especially when the victim is willing to point an accusing finger. This might seem to the jurors to provide a neat and tidy solution, but sometimes (as in the case of Sandy and Lonnie Sawyer) it produces a travesty of justice.

MAJOR FACTORS INFLUENCING EYEWITNESS ACCURACY

How reliable (or should it be unreliable?) is eyewitness testimony? This is the central question we address in this chapter. We have just discussed a case in which the victim's testimony was seriously flawed, but perhaps that is a wholly exceptional case. Unfortunately, we now know that it is not. Throughout most of the twentieth century there was generally no very satisfactory way of proving that innocent people had been found guilty on the basis of inaccurate eyewitness testimony. However, the situation changed dramatically with the introduction of DNA tests. These tests can often establish whether the person convicted of a crime was actually responsible. In the United States, approximately 200 people have been shown to be innocent by means of DNA tests, and more than 75% of these people were found guilty on the basis of mistaken eyewitness identification. During the writing of this chapter in early 2008, DNA testing led to the release of Charles Chatman, who spent nearly 27 years in prison in Dallas County, Texas. He was 20 years old when a young woman who had been raped picked him out from a lineup. As a result of her eyewitness testimony,



Eyewitness testimony has been found by psychologists to be extremely unreliable, yet judges and jurors tend to find such testimony highly believable. © image100/Corbis.

Chatman was sentenced to 99 years in prison. On his last night in prison, Chatman said to the press: "I'm bitter, I'm angry. But I'm not angry or bitter to the point where I want to hurt anyone or get revenge."

There have several other cases in Dallas in which guilty verdicts have been overturned on the basis of DNA evidence. This seems to be the case because those involved in administering the law in Dallas are more likely to store the original evidence than in most other areas. That raises the disturbing prospect that the lack of stored DNA evidence means that numerous innocent people languishing in prison have no chance of their guilty verdict being overturned.

You might assume that most judges would be knowledgeable about potential problems with eyewitness testimony, and would use their knowledge to try to ensure a fair trial. These assumptions might well not be justified. Wise and Safer (2004) asked 160 American judges to indicate their agreement or disagreement with various statements about eyewitness testimony on which psychologists have obtained relevant evidence. Worryingly, the judges on average were correct on only 55% of the items, and most believed that jurors knew less about the limitations of eyewitness testimony than they did themselves. Judges minimized the factors causing eyewitness testimony to be inaccurate. As a result, only 23% of them agreed with the following statement: "Only in exceptional circumstances should a defendant be convicted of a crime solely on the basis of eyewitness testimony."

Suspect testimony

There is considerable evidence that our powers of observation are worse than we like to think. For example, consider a study by Simons and Levin (1998) in which people walking across a college campus were asked by a stranger for directions. About 10 or 15 seconds into the discussion, two men carrying a wooden door passed between the stranger and the participants. While this was happening, the stranger was substituted with a man of different height, build, and voice wearing different clothes. If you had taken part in that study, do you think you would have realized that your conversational partner had changed? Most people answer "Yes" to that question. However, in the actual study approximately 50% of the participants failed to notice the switch! This phenomenon of failing to notice apparently obvious changes in an object is known as *change blindness*.

Direct evidence that we are often wildly optimistic about our own observational powers was reported by Levin, Drivdahl, Momen, and Beck (2002). Participants saw a number of videos involving two people having a conversation in a restaurant. In one video, the plates on their table changed from red to white, and in another a scarf worn by one of them disappeared. A third video showed a man sitting in his office and then walking into the hall to answer the telephone. When the view switches from the office to the hall, the first person has been replaced by another man wearing different clothes. These videos had previously been used by the researchers, who found that none of their participants detected any of the changes.

Levin et al. (2002) asked their participants to indicate whether they thought they would have noticed the changes if they had not been forewarned about them. The percentages claiming they would have noticed the changes were as follows: 78% for the disappearing scarf, 59% for the changed man, and 46% for the change in color of the plates. These percentage figures need to be compared against the 0% detection rates for all three changes found in research studies. Levin et al. used the term *change blindness blindness* to describe our misplaced confidence in our ability to detect visual changes. We generally think that we are processing the entire visual scene in front of us reasonably thoroughly and so are well placed to detect changes in any object. In fact, we are very much better at detecting changes in objects that we have previously looked at directly than those we haven't (Hollingworth &

Henderson, 2002). Thus, we underestimate the importance of fixating objects if we are to remember them and to detect changes in them.

The existence of change blindness is good news for those making movies. It means that we rarely spot visual changes when the same scene has been shot more than once with parts of each shot being combined in the finished version of the movie. Here are two examples: In *Grease*, while John Travolta is singing *Greased lightning*, his socks change color several times between black and white; and in *Diamonds are forever*, James Bond tilts his car on two wheels to drive through an alleyway. As he enters the alleyway, the car is balanced on its *right* wheels, but when it emerges on the other side it is miraculously on its *left* wheels!

It could be argued that an eyewitness seeing a novel and dramatic event such as a crime would be much more observant than the participants in the above studies or members of an audience relaxing at the movies. However, that is not necessarily the case. Several factors work against the eyewitness, tending to obscure and distort his/her memory. Some are obvious. The eyewitness is typically not expecting the incident in question to occur, and is often preoccupied with his/her own thoughts and plans. What he/she sees is sometimes of very short duration (e.g. when a cell phone is snatched), and criminals are usually careful to minimize their chances of being recognized (e.g. by being in disguise). As we will see, other, less obvious, factors serve to reduce the accuracy of eyewitnesses' memory.

Remembering what you expected to see

There is much evidence that our memory for events can be influenced by what we expected to see. This is notoriously the case with sporting contests—supporters of the two teams often have almost diametrically opposed memories of crucial moments in the game! For example, consider a classic study carried out by two American social psychologists, Hastorf and Cantril (1954) on a football game between two American universities (Princeton and Dartmouth). A film of the game was shown to Dartmouth and Princeton students, and they were instructed to detect infringements of the rules. Princeton students detected more than twice as many infringements of the rules by Dartmouth than did Dartmouth students.

Expectations probably played a part in an interesting study reported by Lindholm and Christianson (1998). Swedish and immigrant students saw a videotaped simulated robbery in which the perpetrator seriously wounded a cashier with a knife. There were two versions of this robbery, with the perpetrator being Swedish (i.e. with blond hair and light skin) in one version but an immigrant (i.e. having black hair and brown skin) in the other. After watching the video, participants were shown a lineup consisting of color photographs of eight men, four of whom were Swedes and the remainder immigrants. The actual perpetrator was selected about 30% of the time,

Can you imagine elderly ladies like these committing a robbery? According to Bartlett (1932), our stereotypical schemas may influence expectations, which color our memories.

with participants performing slightly better when the perpetrator was ethnically similar to them. However, the central finding was that both immigrant and Swedish participants were about twice as likely to select an innocent immigrant as an innocent Swede. Immigrants are overrepresented in Swedish crime statistics, and this fact probably influenced participants' expectations concerning the likely ethnicity of the perpetrator of a violent crime.

Bartlett (1932) provided an explanation of *why* expectations color our memories. According to him, we possess numerous schemas or packets of knowledge stored in long-term memory, and these schemas lead us to form certain expectations (see Chapter 6). For example, Tuckey and Brewer (2003a) found that most people have the following information in their bank-robbery schema: robbers are male, they wear disguises, they wear dark clothes, they make demands for money, and they have a getaway car with a driver in it.

According to Bartlett's theory, recall involves a process of reconstruction in which all relevant information (including schema-based information) is used to reconstruct the details of an event in terms of "what must have been true." Thus, eyewitnesses' recall of a bank robbery should be systematically influenced by the information contained in their bank-robbery schema.

Tuckey and Brewer (2003a) showed eyewitnesses a video of a simulated bank robbery followed by a test of memory. As predicted by Bartlett's theory, eyewitnesses had better recall for information relevant to the bank-robbery schema than for information *irrelevant* to it (e.g. the color of the getaway car). Thus, eyewitnesses used schematic information to assist in their recall of the bank robbery.

Additional support for Bartlett's theory was reported by Tuckey and Brewer (2003b). Once again, eyewitnesses recalled the details of a simulated crime they had observed. What was of central interest was how the eyewitnesses remembered ambiguous information. For example, some eyewitnesses saw a robber's head covered by a balaclava, so that the robber's gender was ambiguous. As predicted, eyewitnesses generally interpreted the ambiguous information as being consistent with their crime schema (Figure 14.1). Thus, for example, they tended to recall the robber whose head was covered by a balaclava as being male. In other words, their recall was systematically distorted by including information from their bank-robbery schema that did *not* correspond accurately to what they had observed.

Leading questions

Perhaps the most obvious explanation for the inaccurate memories of eyewitnesses is that

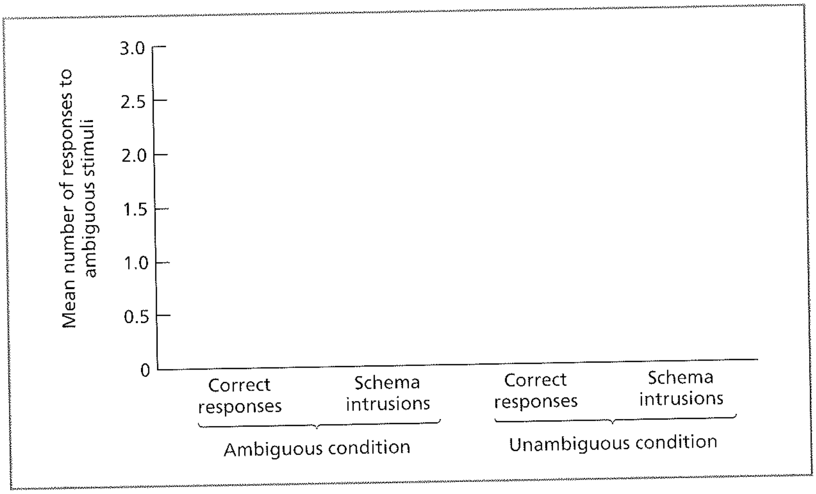


Figure 14.1 Mean correct responses and schema-consistent intrusions in the ambiguous and unambiguous conditions with cued recall. Data from Tuckey and Brewer (2003b).

they often fail to pay attention to the crime and to the criminal (or criminals). After all, the crime they observe typically occurs suddenly and unexpectedly. However, Elizabeth Loftus and John Palmer argued that what matters is *not* only what happens at the time of the crime. According to them, eyewitness memories are fragile and can—surprisingly easily—be distorted by what happens after observing the crime (e.g. the precise questions eyewitnesses are asked). In their well-known study (Loftus & Palmer, 1974), participants were shown a film of a multiple-car accident. After viewing the film, participants described what had happened, and then answered specific questions. Some were asked, "About how fast were the cars going when they hit each other?," whereas others were asked the same question but with the word "hit" replaced by "collided," "bumped," "contacted," or "smashed into."

What did Loftus and Palmer (1974) find? Speed estimates were highest (40.8 mph) when the word "smashed" was used, lower with "collided" (39.3 mph), and lower still with "bumped" (38.1 mph), "hit" (34 mph), and "contacted" (31.8 mph). One week later, all of the participants were asked, "Did you see any broken glass?" In fact, there was no broken glass in the accident. However, 32% of those who had previously been asked about speed using the verb "smashed" said they had seen broken glass. By contrast, only 14% of the participants who had been asked using the verb "hit" said they had seen broken glass. Thus, our memory for events is so fragile that it can be systematically distorted by changing one word in one question! It is likely that the precise schema that was activated varied depending on the particular verb included in the question about speed.

Loftus and Palmer's (1974) findings have been repeated many times, and it is clear that eyewitness memory is easily influenced by misleading information presented after a crime or other incident. For example, Eakin, Schreiber, and Sergent-Marshall (2003) showed participants slides of a maintenance man repairing a chair in an office and stealing some money and a calculator. Some of the eyewitnesses received misleading information presented after the slides. For example, the slides showed the maintenance man hiding the calculator under a screwdriver, whereas the subsequent information referred to a wrench. Eyewitness memory was impaired by misleading information presented after the eyewitnesses had seen the slides. More strikingly, memory was impaired even when the eyewitnesses were warned about the presence of misleading information very shortly after it had been presented.

The above findings indicate that information acquired between original learning (at the time of the event) and the subsequent memory test can disrupt performance on that test. What we have here is a clear example of *retroactive interference*, defined as disruption of memory by the learning of other material during the retention interval (see Chapter 9). Can eyewitness memory also be distorted by *proactive interference* (i.e. learning occurring *prior* to observing the critical event)? Evidence that the answer is positive was reported by Lindsay, Allen, Chan, and Dahl (2004). Participants were shown a video of a museum burglary. On the previous day, they listened to a narrative either thematically similar (a palace burglary) or thematically dissimilar (a school field-trip to a palace) to the video. Eyewitnesses made many more errors when recalling information from the video when the narrative was thematically similar than when it was thematically dissimilar. This is potentially an important finding. In the real world, eyewitnesses often have *previous experiences* of relevance to the questions they are asked about the event or crime. It is entirely possible that these experiences *might* distort some of their answers.

How does misleading postevent information distort what eyewitnesses report? According to Johnson, Hashtroudi, and Lindsay (1993), some of the inaccuracies in eyewitness recall can be understood within the source-monitoring framework. According to this framework, what happens is that a memory probe (e.g. a question) activates memory traces that overlap with it in terms of the information they contain. Any memory probe might activate memories from various sources. The individual decides on the *source* of any activated memory on the basis of the information it contains. However, there is a possibility of source misattribution, with information from the wrong event or memory being retrieved. Source misattribution is especially likely when the memories from one source resemble those from a second source.

Support for the source-monitoring framework was reported by Allen and Lindsay (1998), who presented two narrative slide shows describing two different events with different people in different settings. However, some details in the two events were rather similar (e.g. a can of Pepsi vs. a can of Coca-Cola). Participants were then asked what they remembered from the first event. There was source misattribution, with details from the second event being mistakenly recalled as if they belonged to the first event.

There are other ways in which postevent information can distort eyewitnesses' reports. One possibility is that the memories themselves are changed by this information. However, another possibility is simply that eyewitnesses are responding to social pressure (e.g. to please the experimenter). Loftus (1979) strongly supported the former possibility, arguing that the information from misleading questions permanently alters the memory representation of an incident, with the previously formed memory being "overwritten" and destroyed. She provided evidence for this viewpoint in a study in which eyewitnesses saw a pedestrian accident involving a car stopping at either a stop sign or a yield sign. Two days later, participants were asked questions about the incident, one of which biased them away from what had actually happened. More specifically, if they had seen a stop sign, the biasing question referred to a yield sign, and vice versa. Their memory of the incident was then tested by showing them pairs of slides and asking them which sign they had seen. In the critical pair of slides, one showed a stop sign and the other a yield sign. Loftus argued that if her participants genuinely remembered the correct version but simply responded otherwise to please the experimenter, the bias could be removed by offering a high-enough pay-off for making a correct response. One group was given no reward, one was promised $1 each if they decided correctly, a third group was offered $5, and a fourth was told that the person in the experiment who scored the highest would receive $25. In spite of these incentives, between 70% and 85% of those tested selected the wrong response. This suggests (but does not prove) that the original memory trace had been altered.

Other researchers have reported some evidence that the original memory trace does survive. For example, consider a study by Bekerian and Bowers (1983). They found that the standard Loftus procedure of asking questions in a fairly unstructured way led to the same biasing effect of misleading information she had reported. However, the biasing effect disappeared when participants were questioned systematically, starting with earlier incidents and working through to later ones.

Loftus (1992) argued for a less extreme position than the one she had previously adopted. She emphasized the notion of misinformation acceptance: Eyewitnesses "accept" misleading information presented to them after an event, and subsequently regard it as forming part of their memory for that event. Accepting postevent information in this way becomes more common as the time since the event increases. It is likely that there is more than one way in which misleading postevent information causes eyewitnesses to report distorted memories of the incident they have observed.

The discovery that eyewitnesses' memory can be systematically distorted by information presented either before or after they have observed a crime or other incident is a worrying one. However, such distorting effects could be less damaging than might be imagined.

Eyewitness memory can be impaired by misleading post-event information. However, important information, such as the weapon used in a crime, is less likely to be distorted than peripheral information. © Guy Cali/Corbis.

Memory distortions are more common for peripheral or minor details (e.g. presence of broken glass) than for central details (e.g. features of the criminal) (Heath & Erickson, 1998).

The studies we have been discussing were laboratory studies and so possibly produced different results from those that might have been obtained in real-life situations. For example, Yuille and Cutshall (1986) examined the memories of eyewitnesses to a fatal shooting 5 months afterwards. In spite of the fact that the eyewitnesses had been exposed to misleading questions, all of them had highly accurate memories for what they had observed. However, this study is limited. There were only 13 participants, and they were only exposed to a relatively modest amount of misinformation.

Individual differences

Do you think the age of an eyewitness is relevant when deciding whether his/her memory for an event is likely to be accurate? If you have already read Chapter 12, then your answer should be, "Yes"! Evidence indicating that young children generally make less accurate eyewitnesses than older ones was discussed in that chapter. There is another reason why your answer should have been affirmative—as we will see, there is evidence that the eyewitness testimony of older adults is less accurate than that of young ones.

Brewer, Weber, and Semmler (2005) reviewed research on eyewitness identification in older people (in the 60- to 80-year-old range). Older people were more likely than younger adults to choose someone from a lineup, even when the culprit was not present. In addition, older people are strongly influenced by misleading suggestions. In one study (Mueller-Johnson & Ceci, 2004), older adults with an average age of 76 and young adults (average age 20) underwent relaxation techniques including body massage and aromatherapy. Several weeks later, the participants were given misleading information (e.g. that they had been massaged on parts of their body that had not been touched). The misleading information distorted the memories of the older adults much more than those of the young adults.

Dodson and Krueger (2006) showed a video to younger and older adults, who later completed a questionnaire that misleadingly referred to events not shown on the video. The older adults were more likely than the younger ones to produce false memories triggered by the misleading suggestions. Worryingly, the older adults tended to be very confident about the correctness of their false memories. By contrast, the younger adults were generally rather uncertain about the accuracy of their false memories.

Wright and Stroud (2002) considered differences between younger and older adults who tried to identify the culprits after being presented with crime videos. They found an "own age bias," with both groups being more accurate at identification when the culprit was of a similar age to themselves. Thus, older adults' generally poorer eyewitness memory is less noticeable when the culprit is an older person, perhaps because they pay more attention to the facial and other features of culprits the same age as themselves.

What can be done to enhance the memory of older adults? One of the central memory problems that older adults have is that their memories are very easily distorted by misleading or interfering information. For example, Jacoby, Bishara, Hessels, and Toth (2005) presented misleading information to younger and older adults. On a subsequent test of recall, older adults had a 43% chance of producing false memories based on the misleading information compared to only 4% for the younger adults. Two recommendations follow. First, it is even more important with older adults than with younger ones to ensure that they are not exposed to any misleading information that might distort their memory. Second, older adults often produce memories that are genuine in the sense that they are based on information or events to which they have been exposed. The specific problem is that older adults often misremember the context or circumstances in which the information was encountered. Thus, it is essential to engage in detailed questioning with older adults to decide whether remembered events actually occurred at the time of the crime or other incident.

Eyewitness confidence

Jurors tend to be influenced by how confident the eyewitness seems to be that he/she has correctly identified the culprit. This seems entirely reasonable on the face of it. However, Kassin, Tubb, Hosch, and Memon (2001) found that more than 80% of eyewitness experts agreed that an eyewitness's confidence is *not* a good predictor of his/her identification accuracy! We need to strike a balance here, because there is not always a poor relationship between eyewitness confidence and accuracy. Sporer, Penrod, Read, and Cutler (1995) combined the findings from numerous studies in which eyewitness confidence was assessed immediately after he/she had chosen a suspect from a lineup. They distinguished between choosers (eyewitnesses making a positive identification) and nonchoosers (those not making a positive identification). There was practically no correlation or association between confidence and accuracy among nonchoosers. However, the mean correlation was +.41 among choosers, indicating that choosers' confidence predicted their accuracy to a moderate extent.

Why is eyewitness confidence often a relatively poor predictor of identification accuracy? Perfect and Hollins (1996) addressed this issue. Participants watched a film about a girl who was kidnapped and they were then given a recognition-memory test for the information in it. In addition, they were asked several general-knowledge questions. Their key finding was that participants' confidence didn't predict accuracy with questions about the film but did predict accuracy reasonably well with the general-knowledge questions. Perfect and Hollins argued that eyewitness confidence didn't predict accuracy with recall of information from the film because eyewitnesses do no know whether their ability to remember a witnessed event is better or worse than that of others. As a consequence, they have no solid basis for being low or high in confidence. By contrast, most people know whether their general knowledge compares well or badly with that of others, and this is reflected in their level of confidence.

In court cases, it is likely that the relationship between eyewitness confidence and accuracy is even less than in the laboratory. Prosecution lawyers typically coach eyewitnesses to be confident in their reporting of what they remember. In addition, eyewitnesses might be led by police officers to believe that their identification was correct (this is known as confirming feedback). Confirming feedback would also be likely to increase their confidence in what they remember.

Laboratory evidence on confirmatory feedback was reported by Bradfield, Wells, and Olson (2002). Eyewitnesses watched a 3-minute video of a young man, after which they were shown a videotaped six-person lineup and asked to identify the culprit. In the confirming feedback condition, they were told, "Good, you identified the actual suspect" regardless of whether they selected the culprit or not. In the neutral condition, eyewitnesses didn't receive any feedback. Confirming feedback increased eyewitnesses' confidence in the accuracy of their identification much more when they had been incorrect than when they had been correct. As a result, the relationship between confidence and accuracy was significantly lower in the confirming feedback condition than in the control condition.

Influence of anxiety and violence

One of the authors (Alan Baddeley) was telephoned one Sunday night by a caller announcing himself as a detective with the San Diego Police Force. He explained that he was investigating a multiple throat-slasher whose seventh victim had escaped. The woman claimed that she would be able to recognize her attacker. What, the detective asked, was the likely effect of extreme emotion on the reliability and accuracy of her testimony?

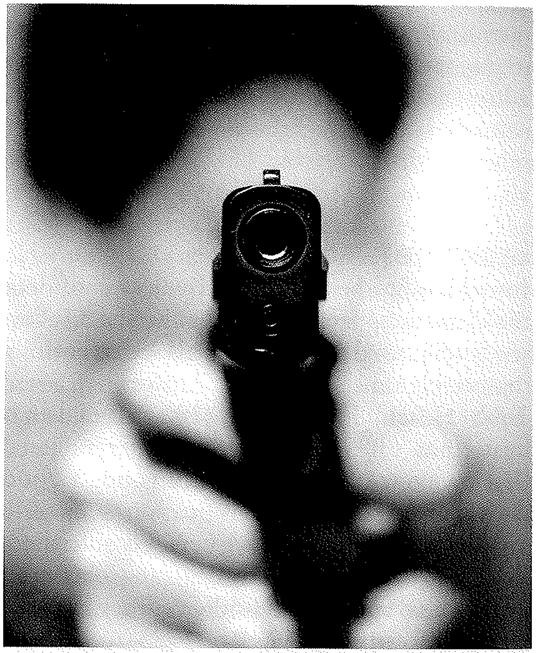
This is an important and extremely controversial issue on which the opinions of different experts vary dramatically. When 235 American lawyers were asked whether high levels of emotion would impair facial recognition, 82% of the defense lawyers argued that recognition would be impaired, compared to only 32% of prosecution attorneys. Who is right? Does extreme emotion brand the experience indelibly on the victim's memory, or does it reduce his/her capacity for recollection? We will shortly turn to a consideration of the evidence. Bear in mind, however, that laboratory studies have, for obvious reasons, not exposed participants to extremely stressful conditions; for example, not even the most zealous experimenters try to convince their participants that they are about to have their throats cut!

The typical way in which the effects of emotion on eyewitness memory are assessed is by exposing eyewitnesses to a film or staged incident in which some crucial event occurs. In different versions, the incident is either associated with or not associated with violence. What is generally found is that memory for a violent event is stronger than memory for the corresponding nonviolent event, but that memory for associated details is less. More specifically, violence leads eyewitnesses to show enhanced memory for what they regard as central aspects of an incident but reduced memory for peripheral aspects.

Much of the research has focused on the **weapon-focus effect**, in which the presence of a weapon causes eyewitnesses to fail to recall details about the assailant and the

KEY TERM

Weapon-focus effect: The finding that eyewitnesses pay so much attention to the attacker's weapon that that they ignore and thus cannot recall other details.



Weapon focus is the phenomenon in which eyewitnesses are so distracted by the weapon used in a crime that they will fail to recall other details of the event.

environment. Loftus (1979) discussed a study in which each participant was asked to wait outside a laboratory before taking part in an experiment. In the "no weapon" condition, the participant overheard a harmless conversation about equipment failure in the experimental room, after which someone emerged holding a pen and with grease on his hands, uttered a single statement, and left. In the "weapon" condition, the participant heard a hostile interchange between two people, ending with breaking bottles, chairs crashing, and someone leaving the experimental room holding a letter opener covered with blood. Again the person uttered a single line before leaving.

All the participants in the study were subsequently given an album containing 50 photographs and asked whether or not the person who had emerged from the room was represented there. In the "no weapon" condition, participants located the correct photograph 49% of the time compared to only 33% in the "weapon" condition. This is a clear example of the weapon-focus effect. However, it seems strange in a way, because it was clearly more important for eyewitnesses to focus on the person's face when a crime had possibly been committed.

The most obvious explanation of the weapon-focus effect is that eyewitnesses tend to focus on the weapon at the expense of other aspects of the situation. Support for this explanation was reported by Loftus, Loftus, and Messo (1987), who asked participants to watch one of two sequences:

1. A person pointing a gun at a cashier and receiving some cash.
2. A person holding a check to the cashier and receiving some cash.

As expected, eyewitnesses looked more at the gun than they did at the check. As a consequence, memory for details unrelated to the gun/check was poorer in the weapon condition.

Pickel (1999) argued that there are two possible reasons for the existence of a weapon-focus effect. First, the weapon poses a threat, and that is why eyewitnesses focus on it rather than on other aspects of the situation. Second, the weapon might attract attention because it is unexpected or unusual in most of the contexts in which it is seen by eyewitnesses. Pickel produced four videos involving a man approaching a woman while holding a handgun to evaluate these explanations:

1. Low threat; expected: gun barrel pointed at the ground; setting was a shooting range.
2. Low threat; unexpected: gun barrel pointed at the ground; setting was a baseball field.
3. High threat; expected: gun pointed at the woman who shrank back in fear; setting was a shooting range.
4. High threat; unexpected: gun pointed at the woman who shrank back in fear; setting was a baseball field.

Four groups of participants in the study by Pickel (1999) each watched one of the videos. Afterwards, the eyewitnesses were tested for their memory of the man with the gun. The findings were clear cut (Figure 14.2). Eyewitnesses' descriptions of the man were much better when the gun was seen in a setting

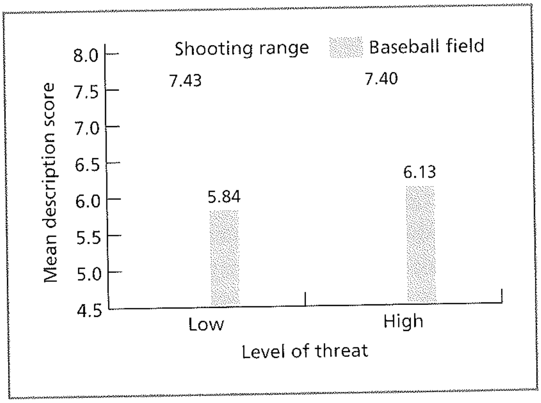


Figure 14.2 Accuracy of eyewitness descriptions of the man with the gun as a function of setting (shooting range vs. baseball field) and level of threat (low vs. high). From Pickell (1999). Reproduced with kind permission from Springer Science+Business Media.

in which guns are expected (a shooting range) than in a setting in which they are unexpected (a baseball field). However, the level of threat had no influence at all on how much eyewitnesses could remember.

We have already indicated that the emotion experienced by participants in laboratory studies is likely to be far less than that experienced by real-life victims of a violent assault. To see whether the strong laboratory evidence for weapon focus was also true of real-life crimes, Valentine, Pickering, and Darling (2003) considered the findings from over 300 real lineups. The presence of a weapon had no effect on the probability of an eyewitness identifying the suspect (but bear in mind that the suspect wasn't always the culprit!). However, Tollestrup, Turtle, and Yuille (1994) found evidence for the weapon focus effect in their analysis of police records of real-life crimes. Thus, we can tentatively conclude that there is a relatively small weapon focus effect with real-life crimes.

Weapon focus has been discussed at length. What are the general effects of stress and anxiety on eyewitness memory? Deffenbacher, Bornstein, Penrod, and McGorty (2004) carried out meta-analyses combining findings from numerous studies on the effects of anxiety and stress on eyewitness memory. In the first meta-analysis, they considered the effects of anxiety and stress on accuracy of face identification. Average correct identifications were 54% for low anxiety or stress conditions compared to 42% for high anxiety or stress conditions. Thus, heightened anxiety and stress have a definite negative impact on eyewitness identification accuracy. In the second meta-analysis, Deffenbacher et al. considered the effects of anxiety and stress on eyewitness recall of culprit details, crime scene details, and actions of central characters. The average percentage of details correctly recalled was 64% in low anxiety or stress conditions compared to 52% in high anxiety or stress conditions. This difference indicates that high anxiety or stress reduces the ability of eyewitnesses to remember details of a crime.

REMEMBERING FACES

Of all the information that eyewitnesses might or might not remember, the face of the culprit is often far and away the most important. In this section, we consider in detail the processes involved in remembering faces, and the factors that can make it hard to do so.

"I never forget a face!" One often hears people making such claims, but how justifiable are they? In view of the huge importance that accurate face recognition plays in our everyday lives, you might imagine that most people would be real experts at identifying the faces of other people. The substantial problems caused by being very poor at identifying faces can be seen most clearly in patients suffering from **prosopagnosia** or face blindness. These patients can recognize most objects reasonably well despite their enormous difficulties with faces. A young prosopagnosic Swedish woman called Cecilia Berman has described the strategies she uses to minimize social embarrassment:

> *Many face-blind people will greet within a second, in spite of not having had enough time to recognize someone ... We have to greet everyone who might be a friend, which can be pretty much everyone we meet ... Some face-blind people ... become experts at pretending they knew all along who someone was when they finally learn about it ... Many face-blind people go to great lengths to avoid using names ... I probably use other people's names in their presence less than once a month, and always with a rush of adrenaline.* (Berman, 2004, pp. 4–5)

KEY TERM

Prosopagnosia: A condition, also known as face-blindness, in which there is extremely poor face recognition combined with reasonable ability to recognize other objects.

There has been considerable controversy on the issue of whether face recognition involves different processes from object recognition (see McKone, Kanwisher, & Dunchaine, 2007, for an excellent review). The fact that most prosopagnosic patients are reasonably good at recognizing objects suggests that faces are processed differently from objects. However, the evidence is hard to interpret. Object recognition typically involves deciding what category an object belongs to (e.g. cat, dog, table). By contrast, face recognition does not involve deciding *whether* a face has been presented but rather *which* specific face it is. Perhaps prosopagnosics would have poor ability to make fine discriminations among objects (e.g. deciding which breed of dog has been presented). In fact, the evidence does not support this prediction. For example, Sergent and Signoret (1992) found that RM, who was prosopagnosic, had an excellent ability to recognize the makes, models, and years of cars. This suggests that there is something special about face processing.

Further evidence that face processing differs considerably from object processing was reviewed by McKone et al. (2007). For example, it has been found many times that the fusiform face area is much more active when faces are presented than when objects are presented. The fact that most patients with prosopagnosia have suffered damage to the fusiform face area strengthens the argument that it is of particular significance in face processing.

How well do we remember faces?

In spite of the importance of face recognition, it seems that most of us are not especially good at remembering faces. Bruce, Henderson, Greenwood, Hancock, Burton, and Miller (1999) investigated this issue. In view of the dramatic increase in the number of closed-circuit television (CCTV) cameras in the US, the UK, and elsewhere, they decided to focus on people's ability to identify someone on the basis of CCTV images. Participants were presented with a target face taken from a CCTV video, together with an array of 10 high-quality photographs (Figure 14.3). Their task was to select the matching face or to indicate that the target face was not present in the array. Performance was disappointingly poor. When the target face was present in the array, it was selected only 65% of the time. When it was *not* present, 35% of participants nevertheless claimed that one of the faces in the array matched the target face. Allowing participants to watch a 5-second video segment of the target person as well as a photograph of their faces failed to improve identification performance.

Some factors determining whether memory for faces is good or poor were identified by Patterson and Baddeley (1977). Participants categorized photographs of unfamiliar people on the basis of various physical features (e.g. chin, nose, eyes, type of hair) or psychological dimensions such as honesty, intelligence, or liveliness. They also considered the effectiveness of disguise. They argued that although it might be easier to remember a face for its honesty or intelligence than for its nose or ears, it might well be that a broad judgment of character would be much more easily misled by disguise. It might be easier to make a person look friendlier or less intelligent than to change the shape of their face or size of their nose.

Initially, Patterson and Baddeley (1977) presented participants with photographs of amateur actors and colleagues, all photographed undisguised or wearing a beard, wig, spectacles, or any combination of them. The photographs were taken either full face or in profile. Their participants were familiarized with one photograph of each person in any one combination of disguised features. This was repeatedly presented until it was consistently recognized and the person's name given correctly. Their participants were then presented with photographs consisting of the target individuals in all possible combinations of disguise, either in full frontal view or in profile, together with a number of similarly disguised but unfamiliar people. Their task was to detect and name the target individuals.

Participants were generally better at recognizing the faces they had categorized

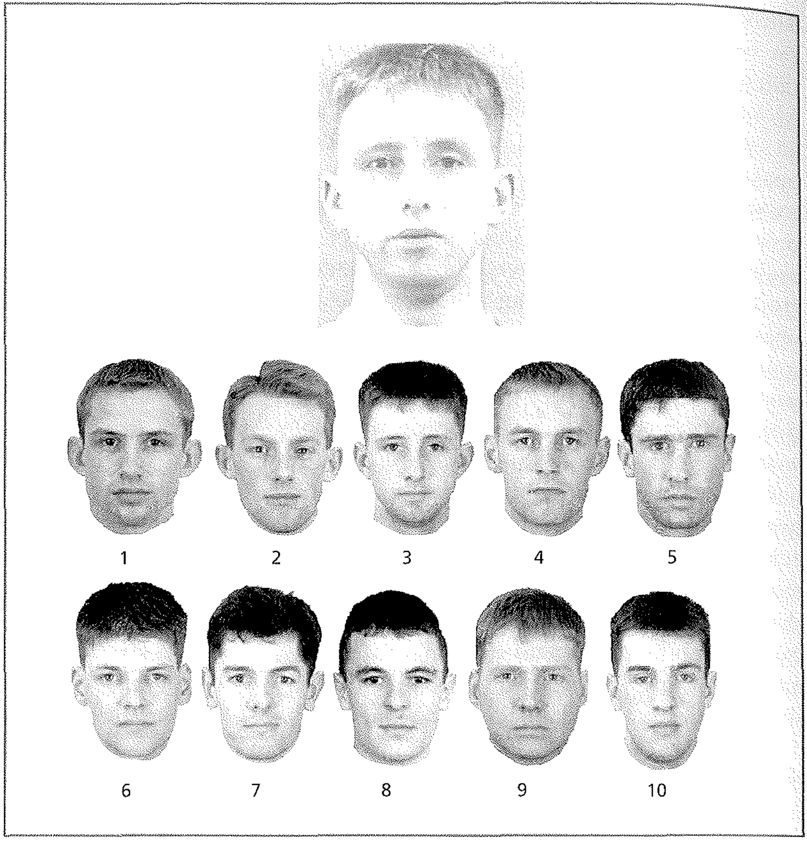


Figure 14.3 Example of full-face neutral target with an array used in the experiments. Readers might want to try the task of establishing whether the target is present in this array and which one it is. The studio and video images used are from the Home Office Police Information Technology Organisation. Bruce et al. (1999). Copyright © American Psychological Association. Reprinted with permission. The target is present in position 3.

using psychological dimensions than those they had categorized using physical features. This effect was fairly small but indicated that there is no advantage in analyzing a face into its component features. The other key finding (Figure 14.4) was that the effect of disguise was very dramatic. Every time an item of disguise was added or removed the probability of recognition went down. Performance ranged from extremely good when the face was presented in its originally learned form to virtual guesswork when the maximum number of disguised features was changed.

Holistic processing

Is there something special or unusually difficult about recognizing faces compared to other objects? It has been argued (e.g. Farah, 1994) that the processing of faces differs from that of other objects in that the emphasis is much more on holistic or global analysis. In other words, we process the *overall* structure of the face and pay little attention to the details (e.g. face, mouth, eyebrows). It is very likely that holistic or global analysis was involved in the research of Patterson and Baddeley (1977) when participants categorized faces using psychological dimensions. By contrast, object processing generally involves more detailed processing in which the parts of an object are processed in turn.

How can we test the notion that holistic processing is more important with faces than with other objects? One way is to consider how good people are at identifying faces presented inverted or upside-down. The detailed features are still easily recognized in inverted faces, but it is much more difficult to identify their overall structure correctly. As predicted, adverse effects of inversion on object recognition are much greater with faces than with nonface objects. In addition, negative effects of inversion

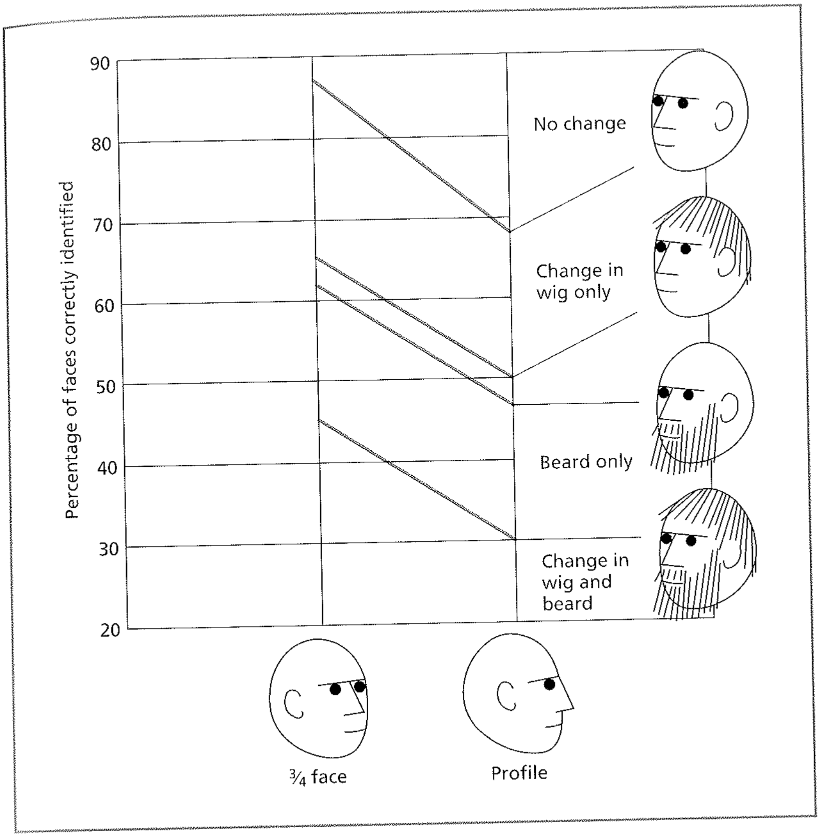


Figure 14.4 With a wig and beard, you halve your chances of being recognized as the guilty party. Faces seen in three-quarters view are much more recognizable than faces seen in profile. From Patterson and Baddeley (1977). Copyright © American Psychological Association. Reproduced with permission.

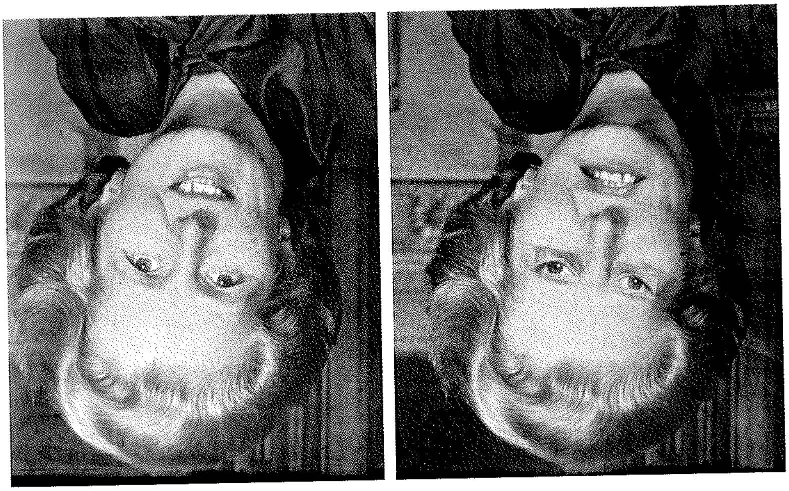


Figure 14.5 The Thatcher illusion. The figure on the left is typically seen as the same as on the right, but it isn't! From Thompson, P. (1980). Margaret Thatcher: A new illusion. *Perception*, 9, 483–484. Copyright © Pion Limited. Reproduced with permission.

with ordinary objects disappear rapidly with practice, whereas those with faces can persist for thousands of trials (see McKone, 2004, for a review). Strikingly, there is the Thatcher illusion (Figure 14.5) involving Mrs Thatcher, who was the British Prime Minister during the 1980s. This illusion occurs because we rely too much on holistic processing. When viewed as an inverted face, we do not realize that the eyes and mouth are inverted relative to the face. However, the grotesque nature of the face becomes very clear when you view it the right way up.

Unconscious transference

There is evidence that eyewitnesses might sometimes be better at remembering faces than at remembering the precise circumstances in which they saw the face. As we will see, this can have important implications. Ross, Ceci, Dunning, and Toglia (1994) carried out a study in which eyewitnesses observed an event in which a bystander was present as well as the culprit. Eyewitnesses were three times more likely to select the bystander than someone they had not seen before when they saw a lineup including the bystander but not the culprit. This effect is known as **unconscious transference**, in which a face is correctly recognized as having been that of someone seen before but incorrectly judged to be responsible for a crime. However, there was no effect when participants were informed before seeing the lineup that the bystander and the culprit were not the same person.

You might be wondering whether unconscious transference happens in real life. One real-life case occurred in Australia. A psychologist (Donald Thomson) took part in a live television discussion on the unreliability of eyewitness testimony. Some time later, he was picked up by the police, who refused to explain why they were arresting him. He assumed he was being unofficially harassed because of his strong views on eyewitness unreliability. At the police station, he was placed in a lineup. A very distraught woman identified him and Donald Thomson was then told he was being charged with rape. When he asked for details, it became clear that the rape had been committed at the same time as he had been taking part in the television discussion. He said he had a perfectly good alibi, and numerous witnesses including an official of the Australian Civil Rights Committee and an Assistant Commissioner of Police. To this, the police officer taking his statement replied: "Yes, and I suppose you've got Jesus Christ and the Queen of England, too!" It turned out that the woman had been raped while watching the program. For Thomson himself, it was an especially unpleasant way of discovering just how right he was to worry about eyewitness unreliability!

Verbal overshadowing

Suppose that you are a police officer and you have arrived at the scene of a crime that occurred only a few minutes ago. You find an eyewitness and have to decide whether to ask him/her to provide a verbal description of the culprit. It seems reasonable to assume that doing so would improve the eyewitness's subsequent ability to recognize the culprit. In fact, however, most of the evidence suggests that eyewitnesses' recognition memory for faces is actually *worse* if they have previously provided a verbal description! This phenomenon is known as *verbal overshadowing*.

Schooler and Engstler-Schooler (1990) provided the first demonstration of verbal overshadowing. Eyewitnesses watched a film of a crime. After that, some eyewitnesses provided a detailed verbal report of the criminal's appearance, whereas others did an unrelated task. Those who had provided the detailed verbal report performed worse than the other eyewitnesses on this test.

Why does verbal overshadowing occur? Clare and Lewandowsky (2004) argued that one answer is that providing a verbal report of the culprit makes eyewitnesses more reluctant to identify anyone on a subsequent lineup. As predicted, Clare and Lewandowsky found there was no verbal overshadowing effect when eyewitnesses were forced to select someone from the lineup and so could not be cautious. Excessive caution seems to be the main explanation of the verbal overshadowing effect when eyewitnesses provide a relatively *brief* verbal description of the culprit.

KEY TERM

Unconscious transference: The tendency of eyewitnesses to misidentify a familiar (but innocent) face as belonging to the person responsible for a crime.

However, when eyewitnesses are asked to provide a *detailed* verbal description, there are often various errors in that description. In such circumstances, these errors account for the verbal overshadowing effect (see Clare & Lewandowsky, 2004, for a review).

Cross-race effect

Finally, there is a controversial issue relating to eyewitnesses' ability to recognize faces. This is the *cross-race effect*, which involves more accurate recognition of same-race faces than of cross-race faces (Box 14.1).

Box 14.1 Cross-race effect

There is a considerable amount of evidence for the existence of the cross-race effect (see Shriver, Young, Hugenberg, Bernstein, & Lanter, 2008, for a review). In most studies, White participants had better recognition memory for White faces than for Black faces, and Black participants had better recognition memory for Black than for White faces. Shriver et al. discussed two hypotheses that might explain the cross-face effect. First, there is the expertise hypothesis: Most of us have had much more experience at distinguishing among same-race than cross-race faces, and so have developed expertise at same-race recognition. Second, there is the social-cognitive hypothesis: We engage in thorough facial processing of individuals with whom we identify (our ingroup) but not of individuals with whom we don't identify (outgroups). In most studies, it is simply not clear whether superior recognition memory for same-race faces than cross-race faces is due directly to race or whether it is more due to the distinction between ingroup and outgroup.

Much evidence appears to support the expertise hypothesis. Eyewitnesses who have the most familiarity and experience with members of another race tend to show a somewhat smaller cross-race effect than others (see review by Shriver et al., 2008). However, the effects of expertise or experience are small, and they also seem to be rather fragile. For example, Hugenberg, Miller, and Claypool (2007) found that the cross-race effect could be eliminated by simply instructing White participants to attend closely to the facial features distinguishing Black faces from each other.

Shriver et al. (2008) studied the cross-race effect in middle-class White students at the University of Miami. They were presented with photographs of college-aged males shown in impoverished contexts (e.g. dilapidated housing, run-down public spaces) or in wealthy contexts (e.g. large suburban homes, golf courses). On a subsequent test of recognition memory, the participants were shown photographs of faces and had to decide which ones they recognized.

What did Shriver et al. (2008) find? As can be seen in Figure 14.6, there were three main findings. First, there was the usual cross-race effect when White and Black faces had been seen in wealthy contexts. Second, there was no cross-race effect when White and Black faces had been seen in

(continued overleaf)

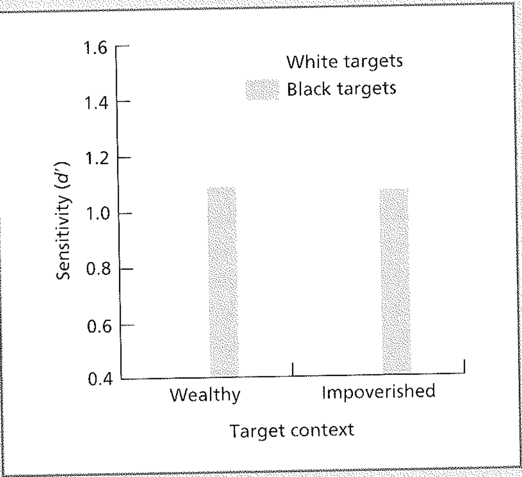


Figure 14.6 Mean recognition sensitivity as a function of target race (white vs. black) and target context (wealthy vs. impoverished). From Shriver et al. (2008). Copyright © 2008, Society for Personality and Social Psychology, Inc. Reprinted by permission of SAGE publications.

Box 14.1 (continued)

impoverished contexts. Third, the White participants recognized White faces much better when they had been seen in wealthy contexts rather than impoverished ones. All of these findings are consistent with the social-cognitive hypothesis: Middle-class White participants regarded White faces in wealthy contexts as ingroup members, whereas White faces in impoverished contexts and Black faces in impoverished or wealthy context were regarded as outgroup members. As predicted by the hypothesis, *only* ingroup faces were well recognized.

POLICE PROCEDURES WITH EYEWITNESSES

The police obviously have no control over the circumstances at the time of a crime. They have to do their best to identify the culprit on the basis of the often limited and inaccurate memories of eyewitnesses. However, the police do have a lot of control over the ways in which eyewitnesses are treated. Here we will focus on two of the most important of such elements of control: (1) lineups; and (2) interview techniques used with eyewitnesses.

Lineups

What happens with a lineup is that the suspect is present along with a number of nonsuspects of broadly similar characteristics and the witness is asked if he/she recognizes any member of the lineup as the criminal. Of course, it is essential that the suspect is not obviously different from the other members of the lineup if the evidence obtained is to be at all valid. In days gone by, it was not unknown for this simple requirement to be totally ignored. In one extreme case, for example, the suspect was known to be Asian but the lineup included only one Asian!

Suggestive evidence that the performance of eyewitnesses is rather fallible when they try to select the suspect from a lineup was reported by Valentine et al. (2003). They analyzed the findings based on 640 eyewitnesses who tried to identify suspects in 314 real lineups organized by the Metropolitan Police in London. Only 40% of witnesses identified the suspect, 20% identified a nonsuspect, and the remaining 40% failed to make an identification.

What (if anything) can be done to improve the identification performance of eyewitnesses confronted by a lineup? One sensible precaution (which is now in general use) is to warn eyewitnesses that the culprit might not be present in the lineup. This issue was explored by Steblay (1997) in a meta-analysis based on combining data from numerous studies carried out under laboratory conditions. Warnings to eyewitnesses reduced mistaken identification rates in culprit-absent lineups by 42%, while reducing accurate identification rates in culprit-present lineups by only 2%. Thus, providing a warning is clearly desirable.

Most lineups are simultaneous, meaning that the eyewitness is presented with everyone in the lineup at the same time. An alternative is to have sequential lineups in which the eyewitness sees only one person at a time. Steblay, Dysart, Fulero, and Lindsay (2001) considered the findings from studies in which simultaneous and sequential lineups were compared. Sequential lineups reduced the chances of mistaken identification when the culprit was absent by almost 50%. However, sequential lineups also produced a significant reduction in accurate identification rates when the culprit was present. What explains these findings is that eyewitnesses adopt a more stringent criterion for identification with sequential than with simultaneous lineups.

Interviewing witnesses

Much of this chapter has been devoted to identifying the limitations of eyewitness memory. It is important to recognize those limitations in order to minimize the probability of innocent people being wrongly convicted solely on the basis of eyewitness testimony. However, it is also important to be constructive and to devise effective interviewing techniques so as obtain as much accurate information as possible from eyewitnesses.

Historically, the police in many countries tended to use inadequate interviewing techniques. For example, they would often ask closed-ended questions (e.g. "What color was the car?"), which mostly elicit only very limited and specific information. A preferable approach is to ask open-ended questions (e.g. "What can you tell me about the car?"). Police in the past would often interrupt eyewitnesses when they were in the middle of saying something. Such interruptions disrupt eyewitnesses' concentration and make it more difficult to retrieve relevant information. A third inadequacy in the interviewing techniques that used to be common was the tendency of police to ask questions in a predetermined order, which took no account of the answers provided by the eyewitness.

Psychologists have made several attempts over the years to produce more effective ways of eliciting information from eyewitnesses. Of particular note has been the development of the cognitive interview, which was originally devised by Geiselman, Fisher, MacKinnon, and Holland (1985). This approach is based on four general retrieval rules:

1. Mental reinstatement of the environment and any personal contact experienced during the crime.
2. Encouraging the reporting of every detail, regardless of how peripheral it might seem to the main incident.
3. Attempting to describe the incident in several different orders.
4. Attempting to report the incident from different viewpoints, including that of other participants or witnesses.

Why might we expect the cognitive interview to be effective? In short, it makes direct use of our knowledge of human memory. The first two rules above are based on the encoding specificity principle (Tulving, 1979; see Chapter 8). According to this principle, eyewitnesses will remember most when there is maximal overlap or match between the context in which the crime was witnessed and the context in which the recall attempt is made. The third and fourth rules are based on the assumption that memory traces are usually complex and contain various kinds of information (e.g. the person's mood at the time of learning). As a consequence, information about a crime can be retrieved using a number of different routes, each of which might provide information about rather different aspects of the original experience.

Fisher, Geiselman, Raymond, Jurkevich, and Warhaftig (1987) devised an enhanced cognitive interview. This includes all four rules discussed already. In addition, it makes use of the following recommendations:

> *Investigators should minimize distractions, induce the eyewitness to speak slowly, allow a pause between the response and next question, tailor language to suit the individual eyewitness, follow up with interpretive comment, try to reduce eyewitness anxiety, avoid judgmental and personal comments, and always review the eyewitness's description of events or people under investigation.* (Roy 1991, p. 399)

How effective is the cognitive interview? The totality of the evidence indicates that it has clear advantages over traditional police interviews. Giselman et al. (1985) compared the effectiveness of three approaches when eyewitnesses were interviewed 48 hours after having watched a police training film of a violent crime. One approach was the standard Los Angeles Police interview and a second approach was the cognitive interview; the third approach involved hypnotizing eyewitnesses before asking them to recall the crime using the standard procedure. Hypnosis is highly controversial, mainly because it increases people's suggestibility and increases the amount of false information reported. Geiselman et al. found that the cognitive interview was the most effective approach—it produced slightly

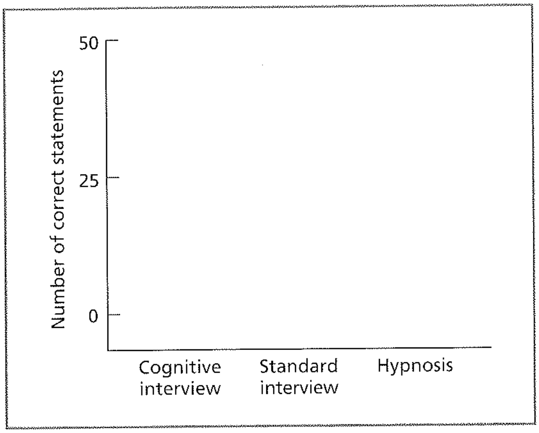


Figure 14.7 Number of correct statements using different methods of interview. Based on data in Geiselman et al. (1985).

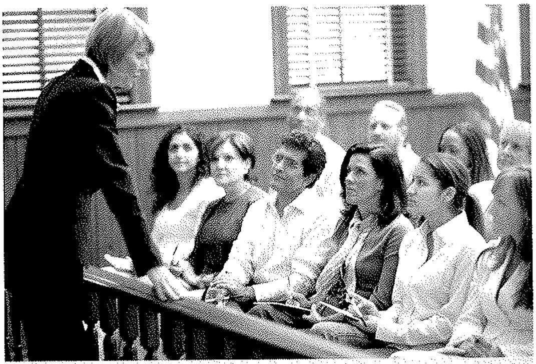
more correct statements than hypnosis and substantially more than the standard police interview on its own (Figure 14.7).

The most thorough attempt to assess the effectiveness of the cognitive interview was reported by Kohnken, Milne, Memon, and Bull (1999), who combined the findings from over 50 studies into a meta-analysis. The cognitive interview consistently elicited more correct information than standard police interviews. Indeed, the average eyewitness given a cognitive interview produced more correct items of information than did 81% of eyewitnesses given a standard interview. However, there was a small cost in terms of reduced accuracy—the average eyewitness given a cognitive interview produced more errors than 61% of those given a standard interview. This needs to be borne in mind by police and lawyers when evaluating the evidence produced from use of cognitive interviews.

There are three final points to be made about the cognitive interview. First, it tends to be less effective at enhancing eyewitness recall when used at longer intervals of time after an incident has occurred. Accordingly, the recommendation is that eyewitnesses should be given a cognitive interview as soon as possible after the crime they have observed. Second, the cognitive interview might be of more value in increasing recall of peripheral details than of central ones (Groeger, 1997). Third, what typically happens is that all the rules and other features of the cognitive interview are used together as a package. As a result, it is not altogether clear which aspects of the cognitive interview are most responsible for its effectiveness.

FROM LABORATORY TO COURTROOM

We have seen that psychologists have succeeded in identifying numerous reasons why jurors should be wary of accepting the reliability of eyewitness testimony. These reasons include change blindness, witnesses' prior expectations, pre- and postevent information, misplaced witness confidence, unconscious transference, verbal overshadowing, and weapon focus. This accumulating evidence led Handberg (1995) to argue in a review of legal opinion that, "Courts should admit eyewitness expert testimony to correct the misperceptions that many jurors have about the reliability of eyewitness identifications." Most psychologists accept that our knowledge of the strengths and limitations of eyewitness memory is such that it is wholly appropriate for experts on eyewitness testimony to testify



Handberg (1995) argued that many jurors have misperceptions about the reliability of eyewitness testimony and that admitting eyewitness expert testimony would help address this issue. © Royalty-free/Corbis.

in court. However, there are a few dissenting voices. For example, Ebbesen and Konecni (1997, p. 2) concluded as follows: "There is no evidence that the experts who testify would be any better at detecting witness inaccuracy than uninformed jurors … the nature of what is known about human memory is so complex that an honest presentation of this knowledge to a jury would only serve to confuse rather than improve their decision-making." In view of these differing opinions, we need to consider what conclusions can validly be drawn from the available evidence. More specifically, we will focus on the issue of ecological validity—do laboratory findings on eyewitness memory generalize to real life?

Laboratory findings are not relevant!

There are several important differences between eyewitnesses' typical experiences in the laboratory and when observing a real-life crime. First, in the overwhelming majority of laboratory studies, the event in question is observed by eyewitnesses rather than by the victim (or victims). This is quite different from real-life crimes, where evidence is much more likely to be provided by the victim than by eyewitnesses. Second, it is obviously less stressful and anxiety provoking to watch a video of a violent crime than to experience a real-life violent crime (especially from the perspective of the victim). Third, laboratory eyewitnesses generally observe the event from a *single* perspective in a passive way. By contrast, eyewitnesses to a real-life event are likely to move around and might be forced to interact with the individual or individuals committing the crime. Fourth, in laboratory experiments on face memory, participants typically have only a few seconds to study each face. With real-life crimes, however, eyewitnesses and victims have on average somewhere between 5 and 10 minutes' exposure to the criminal (Moore, Ebbesen, & Konecni, 1994). Fifth, in laboratory research, the consequences of an eyewitness making a mistaken identification are trivial (e.g. minor disappointment at his/her poor memory). In contrast, they can literally be a matter of life or death in an American court of law.

The main way in which psychologists' knowledge of eyewitness testimony influences court cases is via the presentation of findings on eyewitness testimony by experts in the field. A central concern is that experts in eyewitness testimony (who are mostly called by the defense) will make jurors excessively skeptical about the validity of eyewitness testimony. Leippe (1995) reviewed 12 mock-juror and trial-simulation studies in which the presence versus absence of eyewitness expert testimony was compared. In 10 of the 12 studies, expert testimony significantly increased skepticism about eyewitness testimony, leading to a reduction in guilty verdicts and/or decreased belief in the evidence of eyewitnesses.

The $64,000 question is whether this increase in skepticism is a good or a bad thing. If jurors tend to believe too much in the accuracy of eyewitness testimony, it might be entirely appropriate that their skepticism should be increased. However, it would be undesirable if eyewitness expert testimony leads jurors to return not guilty verdicts even when the overall case against the defendant is strong. This issue was addressed by Leippe, Eisenstadt, Rauch, and Seib (2004), who considered the impact of expert testimony about eyewitness memory introduced towards the end of a murder-trial transcript followed by a reminder about this testimony in the judge's final instructions. The case involved a holdup at night that led to a fatal stabbing. Leippe et al. used three versions of the case in which the evidence against the defendant was very strong, moderately strong, or weak. In all three versions, the prosecution case depended in part on eyewitness testimony from a man who observed the crime from a bedroom window. In the very strong condition, DNA results indicated a 94% certainty that a blood sample taken from the defendant's jacket was that of the victim, there was clear evidence the defendant had been in a struggle (e.g. swollen eye, scraped knuckles), and the victim's wallet was found in a trash can on the block where the defendant lived.

The key findings related to the percentages of mock jurors who decided the defendant was guilty. The presence of expert testimony produced a fairly large reduction in guilty verdicts regardless of the strength of the case. Even when the overall case was very strong, expert testimony reduced guilty verdicts from 74% to 59%. It is certainly arguable that exposing mock jurors to expert testimony made them focus too much on possible inaccuracies in the eyewitness's evidence at the expense of the otherwise strong evidence against the defendant.

It is undeniable that real-life victims of a crime are generally in a much more emotional state than eyewitnesses watching a simulated crime under laboratory conditions. If (as many people believe) our memory is much better for emotionally upsetting events than for more neutral ones, then the memories of witnesses of real-life crimes should be much better than those of witnesses of simulated crimes. However, as we saw earlier in the chapter, there is evidence that high levels of anxiety and/or stress cause an impairment in eyewitness memory (Deffenbacher et al., 2004).

Other concerns about the use of eyewitness expert testimony in court cases were raised by Ebbesen and Konecni (1997). First, research findings on eyewitness memory are often inconsistent, and so there is no clear message that experts can honestly deliver. For example, Deffenbacher (1983) reviewed 21 studies concerned with the relationship between arousal and the accuracy of eyewitness memory. The findings from 10 studies suggested that high arousal *increased* eyewitness accuracy but the remaining 11 studies suggested that it *decreased* eyewitness accuracy.

Second, the accuracy of eyewitness memory depends on characteristics of eyewitnesses (e.g. their memory ability, their attention to detail, their susceptibility to stress, their age) as well as on aspects of the situation (e.g. exposure to misleading information, nature of the line-up). However, most research on eyewitness memory has focused on the situation and ignored individual differences among eyewitnesses.

Third, many of the findings obtained by researchers on eyewitness memory can be expressed in simple terms (e.g. "If the criminal has a weapon, then eyewitnesses are less likely to remember other information including the identity of the criminal"). However, the importance of any single factor (e.g. weapon focus) always depends on several other factors in the situation. For example, it seems probable that the extent of any weapon focus effect would depend greatly on the length of time involved—eyewitnesses who have several minutes to look at the criminal are likely to show less of a weapon focus effect than those who have only a few seconds. Such complexities are not studied very often and tend not to be included in eyewitness expert testimony.

Ebbesen and Konecni summarized the arguments against the value of research on eyewitness memory to the legal system as follows:

> *There is no direct evidence that the kinds of testimony offered by defense experts about factors that might affect eyewitness memory can improve the accuracy of jury decisions. Because the evidence is either inconsistent or insufficient in almost every area in which eyewitness experts testify and because there is no research that provides the experts, much less the jurors, with rules to use in translating the evidence to particular decisions in particular cases, we believe that eyewitness testimony is more prejudicial than probative [affording proof] and should not be allowed in court.* (Ebbesen & Konecni, *1997, p. 25*)

Laboratory findings are relevant!

In the previous section, we identified some of the more obvious differences between observers' experiences in the laboratory and in real life. What is of crucial importance is whether these differences have large and systematic effects on the accuracy of eyewitness memory. One way of obtaining relevant evidence is to compare eyewitness memory for both types of experience. Lindsay and Harvie (1988) had eyewitnesses watch an event via slide shows, video films, or live staged events. There were only small differences in accuracy of culprit identification across these three conditions, suggesting that artificial laboratory conditions don't lead to distortions in the findings obtained.

Ihlebaek, Løve, Eilertsen, and Magnussen (2003) made use of a staged robbery involving two robbers armed with handguns. In the live condition, the eyewitnesses were ordered repeatedly to "stay down." A video taken during the live condition was presented to eyewitnesses in the video condition. There were important similarities in memory in the two conditions. For example, participants in both conditions exaggerated the duration of the event, and the patterns of memory performance (i.e. what was well and poorly remembered) were similar. However, eyewitnesses in the video condition recalled more information than those in the live condition. They estimated the robbers' age, height, and weight more closely, and they also identified the robbers' weapons more accurately.

Ihlebaek et al.'s findings suggest that witnesses to real-life events are more inaccurate in their memories of those events than are those who observe the same events under laboratory conditions. This finding (if confirmed) is important. The implication is that the inaccuracies and distortions in eyewitness memory obtained under laboratory conditions provide an *underestimate* of eyewitnesses' memory deficiencies for real-life events. If so, it is legitimate to regard laboratory research as providing evidence of genuine relevance to the legal system.

Tollestrup et al. (1994) analyzed police records concerning the identifications by eyewitnesses to crimes involving fraud and robbery. What they discovered was that factors that have been found to be important in laboratory studies (e.g. exposure duration, weapon focus, retention interval) were also important in real-life crimes. Thus, for example, identification accuracy was higher when the eyewitness was exposed to the culprit for a relatively long period of time and when the interval of time between the crime and the initial questioning was short.

One of the arguments put forward in favor of the notion that eyewitness expert testimony should be presented in court cases is the assumption that jurors typically exaggerate the accuracy of eyewitnesses' memory for events they have observed. There have been several laboratory studies in which eyewitnesses observed a staged theft, provided testimony about it via cross-examination, and then tried to identify the thief from a photospread (see Leippe, 1995, for a review). Mock jurors then watched the videotaped testimony of an accurate or an inaccurate witness, and judged his/her accuracy. It is typically found that mock jurors cannot discriminate between accurate and inaccurate witnesses. More importantly in the present context, inaccurate witnesses are generally judged mistakenly to be accurate by 40–80% of the mock jurors.

Those who argue that eyewitness expert testimony should be presented in court cases often claim that most jurors are insensitive to the factors influencing the accuracy of eyewitness memory. Lindsay, Lim, Marando, and Cully (1986) used two versions of a burglary trial with mock jurors. In one version, the lighting was very good (broad daylight) and the eyewitness was exposed to the thief for more than 30 minutes. In the other version, the lighting was very poor (20 meters from a streetlight late at night) and the eyewitness saw the thief for only 5 seconds. These dramatic variations in witnessing conditions had no impact on the proportion of mock jurors reaching guilty verdicts.

The best way of reducing jurors' insensitivity to factors affecting eyewitness memory is by admitting expert testimony. Cutler, Penrod, and Dexter (1989) supplied relevant evidence in a study in which mock jurors viewed a realistic videotaped trial in which there was an armed robbery of a liquor store. The main evidence was the victim's identification of the defendant. The witnessing and identification conditions were good or poor. In the poor condition, the robber was disguised, he brandished a handgun, the identification took place 14 days after the robbery, and the lineup instructions were suggestive (the officer in charge didn't explicitly provide the witness with the option of not choosing anyone). In the good witnessing and identification condition, the robber was not disguised, his handgun was hidden throughout the robbery, the identification took place 2 days after the robbery, and the lineup instructions were not suggestive.

Cutler et al. (1989) found that the quality of the witnessing and identification conditions had a significant impact on jurors' judgments as to the accuracy of the witness's identification when they were presented with eyewitness expert testimony but had practically no effect when this expert testimony was not presented. In addition, the verdict was much more influenced by the witnessing and identification conditions when expert testimony was presented than when it was not. Thus, jurors not exposed to eyewitness expert testimony were fairly insensitive to the quality of the witnessing and identification conditions to which the eyewitness was exposed.

Another approach can be taken when trying to assess the usefulness of the knowledge of eyewitness memory obtained by psychologists in laboratory studies. What happens is that eyewitnesses view a simulated crime and their subsequent testimony about that crime is videotaped. Simulated jurors then view the videotapes and judge the witness's accuracy. After this, half of the jurors hear expert testimony based on laboratory findings concerning factors that influence eyewitness identification, whereas the other half do not. Finally, all of the jurors reach a decision. The typical finding is that jurors who have heard the expert testimony make more accurate decisions than those who have not (see Penrod & Cutler, 1995, for a review). That is fairly direct evidence for the value of laboratory studies on eyewitness testimony.

There is an important final point to be made: When eyewitness experts testify in court, they discuss only those findings from eyewitness research that are generally agreed to be well established. There could be genuine concerns if experts related these findings to the specific eyewitness involved in a court case, for example, by arguing that his/her memory is untrustworthy. In fact, however, eyewitness experts are explicitly forbidden to do this, as it is entirely up to the jurors to decide what (if any) credence they should place on the testimony of an eyewitness.

The case in favor of permitting laboratory findings obtained by eyewitness researchers to be presented in court was summarized by Leippe (1995):

> *The knowledge [from eyewitness research] is not perfect, and the jury decisions it influences will not perfectly serve justice without exception. Perfection has never been a reachable goal of any justice system, however. Improving the batting average of just decisions on a fair playing field is a more sensible goal, and embracing a careful eyewitness expert testimony as a judiciously applied option will help reach that goal.*

It seems reasonable to conclude that the evidence obtained by eyewitness researchers is relevant and should be presented to juries. The single strongest argument in favor of this conclusion is that the findings from police records and from naturalistic research are generally very much in agreement with those obtained under typical laboratory conditions. There is also convincing evidence that most jurors can be unduly influenced by the testimony of eyewitnesses (especially confident ones), and eyewitness expert testimony can assist in making jurors properly skeptical of eyewitnesses' memories.

In spite of the value of eyewitness research, there is still much to do. We have identified many of the factors influencing eyewitness memory, but we lack a good understanding of *why* they are important and *how* they interact with each other.

SUMMARY

We generally believe that we perceive nearly everything in the visual environment in front of us. However, our frequent inability to detect changes in that environment shows that our belief is wrong. Our memories are sometimes distorted in the direction of remembering what we expected to see rather than what actually occurred. Eyewitness memories are fragile and can easily be distorted by postevent information (e.g. misleading questions) producing retroactive interference. Eyewitness memories can also be distorted by pre-event information (proactive interference). An eyewitness's confidence is often a poor predictor of the accuracy of his/her memory for an event.

Most people are not very good at remembering faces, and this is especially the case when the other person is in disguise. The processing of faces differs from that of other objects in that there is more emphasis on holistic processing and less on processing of details. Eyewitnesses are sometimes better at remembering faces than the exact situation in which they saw the face. This can lead to unconscious transference, in which eyewitnesses mistakenly identify a familiar face as belonging to the criminal. The cross-race effect probably occurs mainly because we do not process the faces of outgroup members as thoroughly as those of ingroup members.

Eyewitnesses sometimes attend so closely to the criminal's weapon that their memory for his/her features is impaired; this is known as weapon focus. However, the evidence for weapon focus is less strong with real-life crimes than with simulated laboratory ones.

We can improve the accuracy of eyewitnesses' identification performance on lineups by warning them that the culprit might not be present. Another useful strategy is to use sequential lineups rather than simultaneous ones.

Eyewitnesses remember more information about an event if questioned by means of a cognitive interview rather than by a traditional police interview. Cognitive interviews are based on the notion that memory is best when there is a close match between the context in which the crime was committed and the interview context. In addition, it is assumed that memory traces contain various kinds of information, and so information about a crime can be retrieved using various different approaches.

There are many differences between eyewitnesses' experiences when observing a crime in the laboratory and in real life. In the laboratory, the event is typically observed by eyewitnesses rather than victims, there is little or no stress involved, and eyewitnesses have only a few seconds to study the culprit. By contrast, in real life the event is generally observed by the victim, there may be extremely high levels of stress, and on average eyewitnesses and victims observe the culprit for between 5 and 10 minutes. However, the factors that have been found to influence the accuracy of eyewitness memory in the laboratory also do so with more naturalistic studies and with real-life crimes. Jurors who are informed of the findings from eyewitness research tend to be more sensitive to factors influencing eyewitness memory, and are more skeptical about the likely accuracy of what eyewitnesses claim to remember.

FURTHER READING

- **Ebbesen, E. B., & Konecni, V. J.** (1997). Eyewitness memory research: Probative vs. prejudicial value. *The International Digest of Human Behavior, Science, and the Law*, *5*, 2–28. Potential problems with allowing eyewitness experts to testify in court are discussed in detail.
- **Fisher, R. P.** (1999). Probing knowledge structures. In D. Gopher & A. Koriat (Eds.), *Attention and performance XVII: Cognitive regulation of performance: Interaction of theory and application*. Cambridge, MA: MIT Press. The strengths and limitations of the cognitive interview as a technique for obtaining information from eyewitnesses are discussed in detail.
- **Lindsay, R. C. L., Ross, D. F., Read, J. D., & Toglia, M. P.** (2007). *The handbook of eyewitness psychology: Volume II: Memory for people*. Mahwah, NJ: Lawrence Erlbaum Associates. This book is both comprehensive and up-to-date, and contains contributions from the world's leading experts on eyewitness memory for people.
- **Loftus, E. F.** (2004). Memories of things unseen. *Current Directions in Psychological Science*, *13*, 145–147. Some of the reasons why eyewitness testimony is fallible are considered in this article.
- **Toglia, M. P., Read, J. D., Ross, D. F., & Lindsay, R. C. L.** (2007). *The handbook of eyewitness psychology: Volume I: Memory for events*. Mahwah, NJ: Lawrence Erlbaum Associates. This book is an invaluable source of up-to-date information on eyewitness memory for events with contributions from leading researchers in several countries.
- **Wells, G. L., & Olson, E. A.** (2003). Eyewitness testimony. *Annual Review of Psychology*, *54*, 277–295. This article provides a useful overview of several factors influencing the accuracy of eyewitness identification.